Listing of Claims:

1. (Original) An apparatus comprising:

a first metal electrode layer;

a metal nitride layer adjacent to the first metal electrode layer;

a polymer ferroelectric layer adjacent to the metal nitride layer;

a metal oxide layer adjacent to the polymer ferroelectric layer; and

a second metal electrode layer adjacent to the metal oxide layer;

wherein the metal nitride and metal oxide layers contain excess holes to recombine with electrons injected from the first and second metal electrode layers.

2. (Original) The apparatus of claim 1 wherein the first metal electrode layer and second metal electrode layer are tantalum.

3. (Original) The apparatus of claim 1 wherein the polymer ferroelectric layer is polyvinylidene fluoride.

4. (Original) The apparatus of claim 1 wherein the polymer ferroelectric layer is a polyvinylidene fluoride trifluoroethylene copolymer.

5. (Original) The apparatus of claim 1 wherein the metal nitride layer is tantalum nitride.

6. (Original) The apparatus of claim 5 wherein the tantalum nitride is doped with hafnium to create excess holes in the tantalum nitride lattice.

7. (Original) The apparatus of claim 6 wherein the tantalum nitride has a hole density is approximately between 10^20/cm^3 and 10^21/cm^3.

8. (Original) The apparatus of claim 5 wherein the tantalum nitride is deposited in the presence of excess nitrogen to create excess holes in the tantalum nitride lattice.

9. (Original) The apparatus of claim 8 wherein the tantalum nitride has a hole density of approximately between 1.8*10^21/cm^3 and 5.4*10^21/cm^3.

10. (Original) The apparatus of claim 1 wherein the metal oxide layer is tantalum oxide.

11. (Original) The apparatus of claim 10 wherein the tantalum oxide layer is doped with hafnium to create excess holes in the tantalum oxide lattice.

12. (Original) The apparatus of claim 11 wherein the tantalum oxide has a hole density is approximately between 10^20/cm^3 and 10^21/cm^3.

13. (Original) The apparatus of claim 10 wherein the tantalum oxide layer is deposited in the presence of excess oxygen to create excess holes in the tantalum oxide lattice.

14. (Original) The apparatus of claim 13 wherein the tantalum oxide has a hole density of approximately between $7*10^{21}/cm^3$ and $2.1*10^{22}/cm^3$.

15. (Withdrawn) A method comprising:

depositing a first metal electrode layer;

depositing a metal nitride layer adjacent to the first metal electrode layer;

depositing a polymer ferroelectric layer adjacent to the metal nitride layer;

depositing a metal oxide layer adjacent to the polymer ferroelectric layer; and

depositing a second metal electrode layer adjacent to the metal oxide layer;

wherein the metal nitride and metal oxide layers contain excess holes to recombine with electrons injected from the first and second metal electrode layers

16. (Withdrawn) The method of claim 15 wherein the first metal electrode layer and second metal electrode layer are tantalum.

17. (Withdrawn) The method of claim 15 wherein the polymer ferroelectric layer is polyvinylidene fluoride.

18. (Withdrawn) The method of claim 15 wherein the polymer ferroelectric layer is a polyvinylidene fluoride trifluoroethylene copolymer.

19. (Withdrawn) The method of claim 15 wherein the metal nitride layer is tantalum nitride.

20. (Withdrawn) The method of claim 19 further comprising doping the tantalum nitride with hafnium to create excess holes in the tantalum nitride lattice.

21. (Withdrawn) The apparatus of claim 20 wherein the tantalum nitride has a hole density is approximately between 10^20/cm^3 and 10^21/cm^3.

22. (Withdrawn) The method of claim 19 further comprising depositing the tantalum nitride in the presence of excess nitrogen to create excess holes in the tantalum nitride lattice.

23. (Withdrawn) The apparatus of claim 22 wherein the tantalum nitride has a hole density of approximately between 1.8*10^21/cm^3 and 5.4*10^21/cm^3.

24. (Withdrawn) The method of claim 15 wherein the metal oxide layer is tantalum oxide.

25. (Withdrawn) The method of claim 24 further comprising doping the tantalum oxide layer with hafnium to create excess holes in the tantalum oxide lattice.

26. (Withdrawn) The apparatus of claim 25 wherein the tantalum oxide has a hole density is approximately between 10^20/cm^3 and 10^21/cm^3.

27. (Withdrawn) The method of claim 24 further comprising depositing the tantalum oxide layer in the presence of excess oxygen to create excess holes in the tantalum oxide lattice.

28. (Withdrawn) The apparatus of claim 27 wherein the tantalum oxide has a hole density of approximately between 7*10^21/cm^3 and 2.1*10^22/cm^3

29. (Original) An apparatus comprising:

a metal nitride layer;

a polymer ferroelectric layer adjacent to the metal nitride layer;

a metal oxide layer adjacent to the polymer ferroelectric layer;

wherein the metal nitride and metal oxide layers include a plurality of electron traps.

30. (Original) The apparatus of claim 29 wherein the polymer ferroelectric layer is polyvinylidene fluoride.

31. (Original) The apparatus of claim 29 wherein the polymer ferroelectric layer is a polyvinylidene fluoride trifluoroethylene copolymer.

32. (Original) The apparatus of claim 29 wherein the metal nitride layer is tantalum nitride.

33. (Original) The apparatus of claim 32 wherein the tantalum nitride is doped with hafnium to create electron traps in the tantalum nitride lattice.

34. (Original) The apparatus of claim 32 wherein the tantalum nitride is deposited in the presence of excess nitrogen to create electron traps in the tantalum nitride lattice.

35. (Original) The apparatus of claim 29 wherein the metal oxide layer is tantalum oxide.

36. (Original) The apparatus of claim 35 wherein the tantalum oxide layer is doped with hafnium to create electron traps in the tantalum oxide lattice.

37. (Original) The apparatus of claim 35 wherein the tantalum oxide layer is deposited in the presence of excess oxygen to create electron traps in the tantalum oxide lattice.

38. (Withdrawn) A method comprising:

depositing a metal nitride layer;

depositing a polymer ferroelectric layer adjacent to the metal nitride layer;

depositing a metal oxide layer adjacent to the polymer ferroelectric layer;

wherein the metal nitride and metal oxide layers include a plurality of electron traps.

39. (Withdrawn) The method of claim 38 wherein the polymer ferroelectric layer is polyvinylidene fluoride.

40. (Withdrawn) The method of claim 38 wherein the polymer ferroelectric layer is a polyvinylidene fluoride trifluoroethylene copolymer.

41. (Withdrawn) The method of claim 38 wherein the metal nitride layer is tantalum nitride.

42. (Withdrawn) The method of claim 41 further comprising doping the tantalum nitride with hafnium to create electron traps in the tantalum nitride lattice.

43. (Withdrawn) The method of claim 41 further comprising depositing the tantalum nitride in the presence of excess nitrogen to create electron traps in the tantalum nitride lattice.

44. (Withdrawn) The method of claim 38 wherein the metal oxide layer is tantalum oxide.

45. (Withdrawn) The method of claim 44 further comprising doping the tantalum oxide layer with hafnium to create electron traps in the tantalum oxide lattice.

46. (Withdrawn) The method of claim 44 further comprising depositing the tantalum oxide layer in the presence of excess oxygen to create electron traps in the tantalum oxide lattice.